

that all the plants, whether with insects or with none, were equally healthy.

Some observers have recorded that there is a motion of the leaves as well as of the glandular hairs in the effort to catch insects. Only one fact was noticed bearing on this question: one leaf of a *Drosera filiformis* had coiled over towards its upper surface from the apex, and held an insect in its folds.—*Proc. Acad. Nat. Sci. Philadelphia*, July 20, 1875.

On the Classification and Synonymy of the Stellerida.

By M. E. PERRIER.

In presenting to the Academy the first part of my "Révision de la Collection des Stellérides du Muséum d'Histoire Naturelle de Paris," I request permission to submit the principal results contained in the portion of this work which is still to be published, and which will include the investigation of five of the eight families into which I divide the Stellerida known at the present day. These families are the Goniasteridæ, Asterinidæ, Pterasteridæ, Astropectinidæ, and Brisingidæ. As in the case of the first three families, the Asteriadæ, Echinasteridæ, and Linckiadæ, it is especially from the various arrangement of the skeletal pieces that the primordial characters have been derived. With me the family Goniasteridæ corresponds to the genera *Astrogonium*, *Goniodiscus*, *Stellaster*, *Asteropsis*, *Oreaster*, and *Culcita*, as defined by Müller and Troschel; but I have not been able to adopt the limitation of these genera marked out by those authors. Their genera *Goniodiscus* and *Asteropsis* especially are eminently artificial. The genera created by Gray are, in some respects, better, but too numerous; the truth seems to me to lie between the two. For the new limitation of the genera, I have appealed sometimes to the form of the skeletal pieces, sometimes to the arrangement of the pedicellariæ, which had previously furnished such clear characters in the family Asteriadæ. I cannot, however, accept the great genus *Goniaster* which Von Martens has endeavoured to reestablish. From an examination of Gray's types in the British Museum, his genera *Randasia* and *Hosea*, which belong to this family, must fall; the former contains only young *Culcita*, the latter young *Antheneæ*.

The genera composing my family Asterinidæ are *Patiria*, Gray (restricted), *Nepanthia*, Gray (pars), *Asterina*, Nardo, *Palmipes*, Linck, *Disasterina* (nov. gen.), and *Ganeria*, Gray. This last genus, which is but little known, is a most curious intermediate type between the Asterinidæ and the Astropectinidæ. The *Nepanthiæ* have been wrongly regarded as *Chatasteres*. I have ascertained that Gray united in this genus two very distinct types—one identical with *Chataster* in the family Astropectinidæ, and another which, by its imbricated skeletal pieces, belongs to the family Asterinidæ. This latter is our *Nepanthia*.

The family Astropectinidæ includes the genera *Chataster*, *Luidia*, *Astropecten*, *Archaster*, and *Ctenodiscus*. Each of the other two families contains only a single genus.

Beyond these modifications introduced into the systematic arrange-

ment of the starfishes, the important question of the synonymy has engaged all my attention; and in this also I have had to make many rectifications. The direct comparison of the types of Lamarek, Müller and Troschel, Duchassaing, and Michelin with Gray's types, which were studied in London, and those which Dr. Lütken was kind enough to send to me, the examination of the specimens recently brought from New Zealand by M. Filhol, and which have been identified with Capt. Hutton's types, and the study of the specimens ticketed by various American Museums which I found in London and Paris, and in the collection of M. Cotteau at Auxerre, have led me to the following conclusions.

Asterias striata, Lam., which every one, on the faith of Müller and Troschel, regarded as an *Asteracanthion*, does not even belong to the family Asteriadae, of which that genus forms part, and must constitute a distinct genus of the Echinasteridae (*Valvaster*, gen. nov.).

Asterias calamaria, Gray, and *Coscinasterias muricata*, Verrill, are identical. *Asterias echinophora*, *A. clavigera*, and *A. exigua* of Lamarek have been described under new names, which must be suppressed. *Ophidiaster Leachii*, Gray, and *Leiaster coriaceus*, Peters, are identical. This is also the case with *O. pyramidatus*, Gray, and *O. porosissimus*, Lütken; *O. cylindricus*, Lam., and *O. asperulus*, Lütk.; *O. pusillus*, Müll. & Tr., and *O. granifer*, Lütk.; *Linckia pacifica*, Gray, and *L. nicobarica*, Lütk.; *Asterina minuta*, Gray, and *A. folium*, Lütk.; *A. pentagonus*, Müll. & Tr., and *A. Krausii*, Gray; and *Astropecten articulatus*, Say, and *A. dubius*, Gray.

Asteropsis pulvillus and *A. ctenacantha* of Müller and Troschel are only the same species in different states of preservation. We must also regard as identical:—1. *Linckia Guildingii*, Gray, *Scytaster stella*, Duch., and *Linckia ornithopus*, Val.; 2. *Gomophia egyptiaca*, Gray, *Scytaster zodiacalis*, Müll. & Tr., and *Oreaster Desjardinsii*, Mich.; 3. *Astropecten armatus*, Müll. & Tr., *A. polyacanthus*, Müll. & Tr., *A. hystria*, Val., and *A. Wappa*, Val.; 4. *A. armatus*, Gray, *A. erinaceus*, Gray, and *A. Erstedii*, Lütk.; 5. *A. duplicatus*, Gray, *A. Valenciennii*, Müll. & Tr., and *A. variabilis*, Lütk.; 6. *Asteriscus minutus*, Müll. & Tr., *A. marginatus*, Val., and *A. stellifera*, Möbius.

On the other hand, Dr. Lütken believed that *Asterias canariensis*, D'Orb., was identical with *Chætaster longipes*, Retz.; but it is certainly a distinct species, which, indeed, is *Narcissiu teneriffæ* of Gray. It is also in error that Von Martens refers *Astropecten mauritanus*, Gray, to *Archaster angulatus*, Müll. & Tr. Gray's species is certainly an *Astropecten* allied to *A. scoparius*, Val. *Nectria ocellifera*, Gray, is not the same as *A. ocellifera*, Lam.: *Astrogonium australe*, Müll. & Tr., is not, as authors have supposed, the *Tosia australis* of Gray, but his *Tosia aurata*; and it is *A. geometricum*, Müll. & Tr., that represents *Tosia australis*. The *Asteriscus* figured by Savigny is not, as stated, *A. verruculatus*, Mull. & Tr., but *A. cepheus*, Val., which itself appears to be the true *A. Burtonii*, Gray. The remarkable animal described by Hutton under the name of *Pteraster inflatus* is not a *Pteraster*, but a *Palmipes*. *A. obtusangula*, Lam., has been wrongly referred by Müller and Troschel to *Oreaster*; I retain for it the name of *Goniaster*. *Gymnasterias inermis*, Gray, is only a

young *G. carinifera*. The species designated by Verrill under the former of these names consequently remains undetermined. Lastly, Gray's *Petalastres* are true *Luidia*.

I may add that I cannot doubt the identity of the *Luidia senegalensis*, Müll. & Tr., and the *Goniaster africanus* of Verrill from the African coast, with *L. Marcgravi*, Steenstr., and *G. americanus*, Verrill, of the American shore. *Asterina stellifera*, Möbius, and *Linckia Guildingii* are likewise common to both shores.

To sum up: with 200 species, represented by about 1200 specimens, the collection of the Museum possesses nearly half the known species of true starfish, the number of which, according to the lists that I have prepared, may be estimated at 420. In the work of revision that I have just terminated, I did not think I ought to confine myself to the species of our Museum. I have included all those that I have had an opportunity of examining, making a total of 300 species, including close upon 2500 specimens, as to which I have brought together precise information, with regard to both their synonymy and their geographical distribution, the origin of each specimen having been carefully ascertained. These species are divided into 46 genera, many of which had to be created or remodelled. A great number of old species which had been very doubtful have been described afresh from the original specimens; and 50 new Stellerida have been added to the list of known species.—*Comptes Rendus*, December 3, 1875, p. 1271.

On an Amphipod (Urothoë marina), a Commensal of Echinocardium cordatum. By M. A. GIARD.

The sandy shore that stretches between Wimereux and Ambleteuse furnishes in abundance *Echinocardium cordatum*, known to the fishermen under the name of *œuf de Grisard*. Dr. Robertson has given us some details as to the mode of life of this *Spatangus**; but his statements are incomplete and even sometimes incorrect. The urchin lives in the sand at a depth of from 15 to 20 centimetres; it communicates with the surface by two canals of the thickness of a quill, one of which terminates at the central point of the ambulacral star, and the other at the anal aperture. This second canal has not been noticed by Dr. Robertson, who thinks that the sand introduced into the digestive cavity of the animal must be disgorged by the mouth after having served for nutrition, thanks to the organic materials that it contains. The aperture of the anal tube is perfectly circular; that of the apical tube is irregularly three-lobed. The water penetrates by this latter tube, which contains the long contractile filaments ("locomotive feet," "ringed, worm-like suckers"), the movement of which conveys the alimentary particles to the mouth by the anterior furrow. A portion of the water enters through the madreporic plate into the general cavity and aquiferous system. The anal canal serves for the escape of the sand that has traversed the digestive tube. This canal is traversed by a stream of water, the existence of which is difficult to explain, since

* Quart. Journ. Mier. Sci. xi. p. 25.